BELCIN, Ilie, planificator

The team leader Androne Struta. Constr Buc 16 no.744:2 11 April '64.

BELCIU, Ilie; DUMITRU, Vasile, corespondent; CONSTANTIN, A., ing.; GOSAV, Mihai

With the semestral plan carried out. Constr Buc 14 no.650:1 23 Je '62.

1. Din subredactia voluntara de la Turda (for Belciu).

BELCIN, Ilie

In the framework of the monthly trade-union meetings. Constr Buc 16 no. 740:1 14 March 1964.

1. Planificator din subredactia voluntara din Turda.

BELCIUGATEANU, C.

"Aphasia and correlated syndromes in expansive intracranial processes" by M.I.Botez. Reviewed by C.Belciugateanu. Rev psihologie 10 no.1:87 '64.

BELCIUGATEANU, C., dr.; ROMILA, A., dr.; CUPAGEA, D., dr.; PIREE, St., dr.; BORCEA, A., dr.; ELIAS, S., dr.; MIRONTOV, V., dr.; RETEZEANU, Al. S., dr.

Considerations on the evolution of clinical forms of 250 cases of schizophrenia. Nuerologia (Bucur) 10 no.2:109-118 Mr-Ap'65.

1. Lucrare efectuata in Clinica de psihiatrie, Bucuresti.

HUNGARY/Chemical Technology. Chemical Products and Their Application. Medicinals. Vitamins. Antibiotics. H-17

Abs Jour: Ref Zhur-Khim., No 13, 1958, 44316.

Author : Delcsev Istvan, Kovacs Laszlo.
Inst :
Title : Determination of the Content of Zinc and Bismuth in Hemorrhoidal Suppositories.

Orig Pub: Gyogyszeresz, 1956, 11, No 9, 167-168.

Abstract: The suppository, weighed with an accuracy within 0.1 mg, is dissolved in 5 ml of concentrated H_2SO_4, 5 ml of concentrated HNO_3 are added by increments and the mixture is heated until evolution of NO_2 vapors ceases. After the strong foaming has subsided there are added 1-2 ml concentrated H_2O_2 or HNO_3 until the red-brown coloration is discharged.

Card : 1/3

HUNGARY/Chemical Technology. Chemical Products and Their Application. Medicinals. Vitamins. Antibiotics. H-17

Abs Jour: Ref Zhur-Khim., No 13, 1958, 44316.

Complete decomposition of organic substances is effected by addition, by increments, of concentrated H_2O_2, after which the solution is heated until SO_3 vapors are evolved. After cooling, the sulfate suspension which separates from the solution is dissolved in 10 ml 30% solution of HNO_3, NH_4OH is added dropwise until the odor persists on shaking, the mixture is diluted to 100 ml and filtered (the first 10 ml of the filtrate are discarded). To 10 ml of filtrate are added 0.25 g NH_4Cl and 0.1 g Eriochrome Black T, after which the zinc is titrated with 0.05 N solution of Complexon-III, to a steel-blue color. 1 ml of the solution corrospond to 4.069 mg ZnO. The precipitate is dis-

Card : 2/3

Abs Jour: Ref Zhur-Khim., No 13, 1958, 44316.

solved in HNO_3 and diluted to 100 ml. To 10 ml of the solution are added 10 ml water and NH_4OH, dropwise, until a precipitate begins to form which is dissolved with difficulty on shaking, after which there are added 4-5 drops of 0.1% aqueous solution of Pyrocatechol Violet and NH OH until a brilliant blue coloration develops, and the bismuth is titrated with 0.05 N solution of Complexon-III, to a yellow-green coloration. 1 ml of solution corresponds to 10.45 mg Bi. The determination error is of ± 2%.

Card : 3/3

BELCSEVA, Mara, dr.

Principal current problems in the epidemiology of tuberculosis in Bulgaria. Tuberkulozis 14 no.11:325-327 N '61.

1. A Szofiai Orszagos Tbc Intezet kozlemenye.

(TUBERCULOSIS epidemiol)

BELCSIK, Janos, MAV fotanacsos

Extraordinary big tasks for railway freight transportation in November-December. Kozleked kozl 20 no.47:768-769 22 N '64.

1. Division Chief, Department of Railways of the Ministry of Transportation and Postal Affairs, Budapest.

BELDA, J.

"New system of circuits for valve oscillators." p. 235

SDELOVACI TECHNIKA. Praha, Czechoslovakia, Vol. 3, No. 8, Aug., 1955

Monthly List of East European Accessions (EEAI), LC, Vol. 8, No. 9, September, 1959
Unclas

BELA, Josef

The largest radio telescope. Slaboproudy obzor 25 no.12:733 D '64.

CZYZEWSKA, Janina; BELDA-MICHALAK, Janina; RUDKOWSKI, Zbigniew

Genetic antibody deficiency according to our observations.
Pediat. Pol. 39 no.5:499-510 My '64.

1. Z Kliniki Chorob Zakaznych Wieku Dziecicego Akademii Medycznej we Wroclawiu (Kierownik: doc. dr. med. J. Czyzewska).

KLINOWSKA, Wanda; BELDA-MICHALAK, Janina; JAWORSKA, Janina

2 cases of collagenosis. Pediat. pol. 37 no.7:741-746 Jl '62.

1. Z I Kliniki Pediatrycznej AM we Wrocalwiu Kierownik: prof. dr med. H. Hirszfeldowa Ordynator Oddzialu: dr med. W. Klinowska.
(SCLERODERMA in inf & child) (DERMATOMYOSITIS in inf & child)

BELDEANU, Nicolae, ing.

Applications of radioactive isotopes in the glass industry. Industria usoara 11 no.11:590-594 N '64.

1. "Vitrometan" Glass Factory, Medias.

BELEA, Constantin

Determination of transitory conditions in automatic control systems with the aid of a new integration method of dynamic equations. Probleme automatiz 29-40 5 N '62.

BELEA, Constantin, dr. ing.

On the determination of transitory process and stabilized methods in nonlinear and self-tunable automatic systems. Automatica electronia 7 no.6:249-255 N-D'63.

SHINDAROV, L., kand. na med. nauki, BOIUKLIEVA, B.; BELDEDOVA, P.; GORANOV, Iv., Dots.

A virusologically proven case of pleurodynia. Suvrem. med., Sofia 9 no.4:103-107 1958.

1. Iz Republikanskata protivoepidemichna stantsiia (Gl. lekar: L. Shindarov) I-va gradska detska bolnitsa - Sofiia (Gl. lekar: B. Boiuklieva) i Katedra po patologoanatomiia pri IsUL (Zav. katedr.: dots. Iv. Goranov)

(COXSACKIE VIRUSES,
B, isolation in pleuredynia (Bul))

BEL'DEMAN, N., dotsent; ROMANOVSKIY, F., dotsent

Over-all mechanization of the transshipment of raw sugar in bags. Mor.flot 21 no.1:11-13 Ja '61. (MIRA 14:6)

1. Starshiy tekhnolog Odesskogo porta (for Bel'deman).
2. Odesskiy institut inzhenerov morskogo flota (for Romanovskiy).
(Cargo handling) (Sugar--Transportation)

BEL'DEMAN, N., nauchnyy sotrudnik; CHERVINSKIY, G., inzh.

Index of the degree of over-all mechanization of cargo handling operations in harbors. Mor. flot 22 no.8:10 Ag '62. (MIRA 15:7)

1. Chernomorskiy institut po proyektirovaniyu morskikh portov i sudoremontnykh predpriyatiy (for Bel'deman). 2. Chernomorskoye parokhodstvo (for Cherbinskiy).
(Cargo handling)
(Harbors—Equipment and supplies)

BEL'DENKOV, I.S.

Improvement of several parts of the MP-21 press. Masl.-zhir.prom. 21 no.7:35-37 '55. (MLRA 9:1)

1.Novo-Mikhaylovskiy maslozavod.
(Oil industries--Equipment and supplies)

BELYAKOVA, A. F.

"Passing of the Luminous Phase of Development in Plants and the Limit of Geographic Distribution," Dokl. AN SSSR, '50 Vol. 71, No.4, pp. 761-64

Botanical Inst. im. V. L. Komarov

LEYSLE, F. F.; SHCHEGLOVA, O. A. BEL'DENKOVA, A. F.

Botany - Physiology

Influence of light and temperature upon the distribution and variability of plants at different stages of growth, Trudy Bot. Inst. AN SSSR. Eksp. bot., No. 8, 1951.

Monthly List of Russian Accessions, Library of Congress, March 1952. Unclassified.

SHCHEGLOVA, O.A.; BEL'DENKOVA, A.F.

Effect of light and temperature factors on the readjustment and variability of plants in the light of phasic development. Paper 5. Physiological basis of extensive distribution of plants and the formation of new forms. Trudy Bot.inst. Ser.4 no.9:37-62 '53. (MLRA 6:6)

1. Botanicheskiy institut imeni V.L. Komarova akademii nauk SSSR.
(Phytogeography) (Botany--Variation)

SHCHEGLOVA, O.A.; BEL'DENKOVA, A.F.; LEYSLE, F.F.; KORYAKINA, V.F.

Conditions of phasic development as one of the essential factors of geographic distribution of plants and their morphological changes. Izv. AN SSSR Ser.biol. no.4:52-74 Jl-Ag '53. (MLRA 6:7)

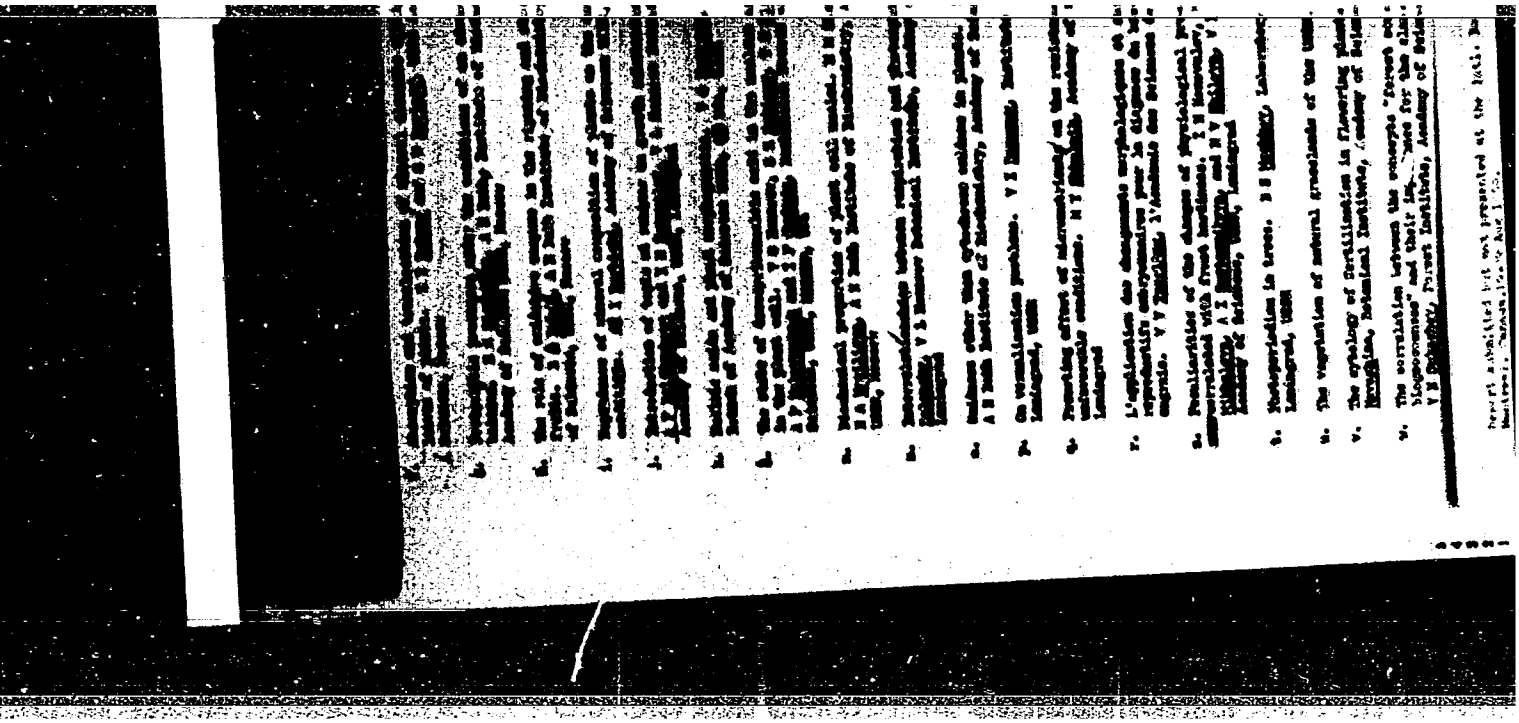
1. Botanicheskiy institut Akademii nauk SSSR.
(Botany--Morphology) (Phytogeography)

BEL'DENKOVA, A.F.

Variability of some plants caused by disturbances in the course of the photophase. Trudy Bot.inst.Ser.4 no.11:270-287 '56.(MLRA 9:9)
(Photoperiodism) (Botany--Morphology)

BEL'DENKOVA, A.F.

Effect of the length of the day and some micro-and macronutrients on the growth and development of corn. Trudy Bot. inst. Ser. 4 no.12: 257-267 '58. (MIRA 11:7)
(Corn (Maize)) (Photoperiodism)
(Plants, Effect of minerals on) (Plants, Effect of nitrogen on)



BEL'DENKOVA, A.F.

Effect of the conditions of growth during the photophase on the morphological variability and some physiological indices of plants. Trudy Bot. inst. Ser.4 no.14:188-208 '60. (MIRA 14:3)
(Photoperiodism) (Botany—Morphology) (Plant physiology)

BEL'DENKOVA, A.F.

Effect of gibberellic acid on the growth, development, and morphological variability of plants. Trudy Bot. inst. Ser. 4 no.15:101-119 '62. (MIRA 15:7)

(Gibberellic acid)

LEYSLE, F. F.; BEL'DENKOVA, A. F.; MUKHINA, V. A.

"Effect of daylength on growth, development, and morphological variability of plants."

report submitted for 10th Intl Botanical Cong, Edinburgh, 3-12 Aug 64.

AS USSR, Leningrad.

BEL'DENKOVA, A.F.

Effect of gibberellin on the growth and development of some farm crops and ornamental plants. Trudy Bot.inst. Ser.4 no.17:24-34 '64.

AUTHOR: Bel'der, M. SOV/4-58-11-15/31

TITLE: Every Day - One Storey (V den' - etazh)

PERIODICAL: Znaniye - sila, 1958, Nr 11, p 21 (USSR)

ABSTRACT: In the near future it will be possible to build a house in one week. The workers of the Akademiya stroitel'stva i arkhitektury SSSR (USSR Academy of Building and Architecture) V.P. Chukavin, Yu.B. Monfred, R.V. Kryukov and F.A. Popov have developed an entirely new method of constructing an apartment house. It will be the starting point for a quick and cheap way of erecting dwelling houses. The multi-storey house is manufactured at a plant in the form of separate, closed box-rooms or apartments. At the building site these boxes need only be assembled, inter-welded and the joints closed . A 5-storey house, consisting of 90 boxes, can be assembled in 10 working shifts. The author describes in detail the economy obtained and other advantages in adopting this method of building. There is 1 drawing.

AUTHOR: Bel'der, M.

SOV/27-59-1-11/31

TITLE: Plastics in Construction (Plastmassy v stroitel'stve)

PERIODICAL: Professional'no-tekhnicheskoye obrazovaniye, 1959, Nr 1, pp 15-18 and 2-3 of centerfold (USSR)

ABSTRACT: The author refers to the future development of the plastics industry, provided for by the 7-year-plan. In view of this development, the author intends to acquaint construction school students with conventional-type plastics and their application in building construction. The following plastics are dealt with: polymeric materials; glass plastics, in which glass fibres are bound by BF-2 and BF-4 glue material; synthetic adhesives - already used in GDR and CSR for glueing together metal bridge parts; synthetic plates produced out of wooden fibres and chips; synthetic resins; foam plastics; plastic veneers; sheet-type plastics; "Linkrust"-type synthetics made of polyvinyl chloride resins; polysterenic plates; linoleum; and a few other plastics designed for producing items such as pipes, water containers, etc. The author especially describes the use of plastics in house

Card 1/2

Plastics in Construction

construction. Pages 2-3 of the centerfold show an illustration of a building constructed mainly of such material. The framework of the structure consists of prefabricated, pressed iron-reinforced columns, cross bars and bearing between the columns. The walls of staircase halls, the staircase platforms and the notch board plates are made of reinforced concrete. The panels are also coated with such concrete. All other parts of the house are built of plastics. There are two diagrams and three sketches.

Card 2/2

BEIDESCU, S.
SURNAME, Given Names

Country: Rumania

Academic Degrees: -not given-

Affiliation: -not given-

Source: Bucharest, Comunicarile Academiei Republicii Populare Romine, Vol XI, No 8, 1961, pp 939-943.

Data: "Heterocypris rostrata n. sp. of the Periodic Waters of the Braila Area."

GPO 981643

BELDI, Miklos

Ornithological observations on the shore of the Black Sea. Aquila 69/70:209-210 '62-'63 [publ. '64].

Hibernating little snipe and spotted crake near Nagyenyed. Ibid.:273

Short-toed larks in the vicinity of Cluj. Ibid.:273

Somber titmouse breeding in the vicinity of Cluj. Ibid.: 274

Barred warbler, sedge warbler and marsh warbler on the main square of Cluj. Ibid.:274-275

PAUNESCU, Cornelia, conf.; VREJOIU, Gh., dr.; HORIA, I., dr.; SICIUESCU, V., dr.; PANA, I., dr.; BELDICEANU, O., dr.; COLEA, ..., dr.; MIRONESCU, C., dr.; DUMITRESCU, Elena, dr.; ANDREE, C., dr.

Considerations on the clinical localization of cervicopharyngeal hematosis. Otorinolaringologie (Bucur.) 10 no.1:5-10 Ja-Mr'65.

1. Lucrare efectuata in Clinica de otorinolaringologie, Bucuresti.

BELDIE, A.

A new willow tree Salix myrtilloides L. in Rumanian flora. p. 1229.
(COMUNICARILLE. Rumania. Vol. 6, no. 10, Oct. 1956)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 7, July 1957. Uncl.

BELDIE, A.

The natural reserve Bucegi. p. 31.
(Ocrotirea Naturii, No. 2, 1956, Bucuresti, Romania)

SO: Monthly List of East European Accessions (EEAL) Lc. Vol 6, No.8, Aug 1957. Uncl.

BELDIE, A.

More about the relationship between vegetation and emplacement. p. 289.

REVISTA PADURILOR

Vol. 71, no. 5, May 1956

Romania

Source: EAST EUROPEAN LISTS Vol. 5, no. 10 Oct. 1956

PRIADCENCU, Al.; BORDEIANU, T., acad.; GRINVALD, Clara; STEFAN, N.; BELDIE, Al.; ANGHEL, Gh.; CEAPOIU, N.; CARAUSU, D.; COCIU, V.

Concept of species reflected in Rumanian works on cultivated plants. Studii cerc biol s. bot 16 no. 2:153-162 '64.

1. Institute of Research of Cereals and Industrial Plants, Laboratory of Hybridization. 2. Corresponding Member of the Rumanian Academy (for Priadcencu, Ceapoiu).

BELDIE, CAMELIA

The system phenol-water-salt. Eugène Papaﬁl, Marie Anne Papaﬁl, and Camelia Beldie. *Analele ştiinţ. univ. "Al. I. Cuza" Iaşi Sect. I* [N.S.], 4, 153-70(1958)(in French).—The effect of halogen salts on the equil. of the system phenol-water, at 25-32°, was studied. $K = (y_0 - y)/c$, where y_0 is soly. of water in pure phenol, y its soly. in the presence of salt, and c the concn. of the salt. K differs with each salt. It decreases in the following order: Na > K > NH_4 > Rb > Cs, and for the same cation: Cl > Br > I. K rises with temp. The variation of the crit. temp. of soln. is: $\Delta t = ac^b$, where a is a const. depending on the specific salt, b another one, depending on the mixt. of the liquids. For 2 salts of the concn. c_1 and c_2 and for the same Δt, $a_1c_1^b = a_2c_2^b$, where $c_1/c_2 = (a_2/a_1)^{1.35}$. In this case b was taken as 0.8, so that $c_1/c_2 = (a_2/a_1)^{1.25}$, which means that c_1/c_2 = const. The soly. of the salts increases in the following order: Na < K < NH_4 < Rb < Cs and Cl < Br < I. It increases also with the temp. of the phenol-water equil. The equiv. rise of the equil. temp. $\Delta t/c$ grows with dilu. $\Delta t/c$ varies with the nature of the salt in the same direction as K. It was found too that $\Delta t_1/\Delta t_2 = a_1/a_2$.

Mella Paecht-Horowitz

PAPAFIL, Eugene; HELDIE, Camelia

Study of the influence of some alkaline sulfates and nitrates on the phenol-water system in equilibrium; considerations on the Hofmeister series. Anal St Jassy I 10 no.2:105-114 '64.

1. Laboratory of General and Physical Chemistry, "Al. I. Cuza" University.

BELDIMAN, M. ; STAICU, C.

Establishing the heating period limits. p. 109.

ENERGETICA. (Asociatia Stiintifica a Inginerilor si Tehnicienilor din Rominia si Ministerul Energiei Electrice si Industriel Electrotehnice) Bucuresti, Rumania, Vol. 7, no. 3, Mar. 1959.

Monthly list of East European Accessions (EEAI) LC, Vol. 8, no. 8, Aug. 1959.

Uncl.

VOINEA, M., ing.; BELDIMAN, M., ing.

Aspects of the first district heating works operated in Bucharest.
Energetica Rum 9 no.5:182-191 My '61.

HELDIMAN, Mircea, ing. (Bucuresti); VOINEA, Mircea, ing. (Bucuresti)

Results and generalization of the new method of hydropneumatic cleaning of distance heating nets. Energetica Rum 10 no.9:398-400 S '62.

1. Institutul de studii si proiectari energetice.

BEJENARU, C., dr.; SIRMON, Elisabeta, dr.; BADEA, Ana, dr.; LUCA, A., dr.; ONU, Mariana, dr.; BURDUJA, Ana, dr.; BELDIMAN, N., dr.

Contribution to the serological study of animal leptospirosis in the region of Iasi. Microbiologia (Bucur) 10 no.2:147-152 Mr-Ap'65.

1. Laboratorul regional veterinar, Iasi (for Bejenaru, Sirmon, Badea, Luca, Onu). 2. Laboratorul de zoonoze al Institutului de igiena si protectia muncii, Iasi (for Burduja, Beldiman).

BEL'DIMAN, N.F., inzh.

Calculation of the trigger resistors of the rotor of an asynchronous motor. Elektrotekhnika 36 no.3:44-47 Mr '65.

(MIRA 18:6)

BELDIMAN, T. ; STAICU, I.

Correction of the external conventional minimal temperature. p. 619.

REVISTA CONSTRUCTIILOR SI A MATERIALELOR DE CONSTRUCTII. (Asociatia Stiintifica a Inginerilor si Technicienilor din Romania si Ministerul Constructilor si al Materualelor de Constructii) Bucuresti, Rumania. Vol. 10, no. 12, Dec. 1958.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 6, June 1959

Uncl.

BELDIMAN, V.

RUMANIA

VITA, Alla, Dr, OANA, C., Dr, BORZAS, Ecaterina, Dr, BELDIMAN, V., Dr, GRIGORIU, Z., Dr, HURMUZACHE, T., Dr, GHEORGHIU, Melania, Dr, and WAINFELD, M., Dr. Work performed at the Clinic for Contagious Diseases (Clinica de Boli Contagioase) of the Institute of Medicine (Institutul de Medicina), Iasi.

"Considerations on Two Epidemic Foci of Diphtheria."

Bucharest, Microbiologia, Parazitologia, Epidemiologia, Vol 8, No 1, Jan-Feb 1963, pp 11-14.

Abstract: A study based on the observation of two rural diphtheria foci. Both of them occurred in the fall (October-November) and the source of the disease was the school; morbidity was smaller in the pre-vaccination period due to latent immunity. Both episodes caused familial foci with 2 to 5 infections; secondary infections did not touch children below 3 years of age, reflecting the proper vaccination of this age group. Earlier diagnosis and isolation of the first cases would have prevented the epidemics. Includes 11 references.

1/1

BELONOVSKIY, F.D.

28185

Vychislenie ellipticheskikh integralov. Uchen. zapiski (Vyssh. arkt. mor uchilishche im. adm. Makarova vyp. 1, 1949. s. 19-82
Tsel'nobokin', F.D. The integral (calculus) of the elliptical integrals. Scientific notes, (The higher arkt. of the marine school, named after Admiral Makarov) ; edition I, 1949- page 19-82.

SO. LETOPIS NO. 34

GEFDING, A.K., kandidat tekhnicheskikh nauk; BELDOVSKAYA, I.I., inzhener.

Trenchless pipe laying. Stroi.prom. 32 no.5:22-24 My '54. (MLRA 7:6)
(Pipe)

Beldovskaya, I.I.

GEFDING,A.K., kandidat tekhnicheskikh nauk; BELDOVSKAYA,I.I., inzhener; BOGDANOV,M.I., kandidat tekhnicheskikh nauk, redaktor; KAPLAN,M.Ya., redaktor; PUL'KINA,Ye.A., tekhnicheskiy redaktor

[Pipe laying without trenches] Bestranshеinaia prokladka trub. Leningrad, Gos.izd-vo lit-ry po stroitel'stvu i arkhitekture, 1955. 60 p. (MIRA 9:2)

(Pipelines)

GEFDING,A.K., kandidat tekhnicheskikh nauk; [redacted], inzhener

Using an eccentric-boring machine in trenchless pipe laying.
Stroi. prom. 33 no.4:18-20 Ap '55. (MLRA 8:6)
(Pipe, Steel)

BELDOVSKAYA, I.I., inzh.; GEFDING, A.K., inzh.; KUZNETSOV, M.I., inzh.

Gluing steel pipelines of sanitary engineering systems. Mont. i spets. rab. v stroi. 24 no.8:22-24 Ag '62. (MIRA 15:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut gidrotekhnicheskikh i sanitarno-tekhnicheskikh rabot Ministerstva stroitel'stva RSFSR i Trest Latsantekhmontazh.
(Epoxy resins) (Heating pipes)

BELOWICZ, M.

Ternary binegative-positive systems. I. A new kind of a ternary saddle azeotrope. A. Orszagh, J. Lelakowska, and M. Beldowicz (Univ. Warsaw). *Bull. acad. polon. sci., Sér. sci., chim., géol. et géograph.* 6, 419-25(1958)(in English).—The saddle ternary azeotrope contains $CHCl_3$(I) 76.65, iso-PrBr(II) 14.79, and HCOOEt(III) 8.65 mole %, and b. 61.974°, as was found in combined distn. and ebulliometric measurements with a differential Świętosławski ebulliometer. B.ps. of binary azeotropes were (mole % content given in brackets): I(65.7)-II, neg., 62.2°; III-I(80.63), neg., 62.7°; II-III(70.9), pos., 53.0°. The saddle azeotrope is thus formed with two pairs of components showing neg. deviations from Raoult's law. Accordingly, the surface of b.ps. vs. compns. has a "top-ridge line" which connects the points of binary neg. azeotropes, and a "valley line." J. Stecki

7

8

2 may

GRYNBERG, Halina; SZCZEPANSKA, Hanna; BELDOWICZ, Maria

Importance of selecting certain conditions of analysis in determining the composition of fatty acids by gas-liquid chromatography. Chem anal 8 no.6:881-890 '63.

1. Department of Chemistry and Analysis of Fats, Institute of General Chemistry, Warsaw.

P/021/60/000/010/002/006
A105/A026

AUTHOR: Bełdowski, Tadeusz, Master of Engineering

TITLE: Heating Effect of Alternating Magnetic Fields on Steel Structures

PERIODICAL: Przegląd Elektrotechniczny, 1960, No. 10, pp. 416 - 419

TEXT: The article deals with the computation of temperature increases in steel structures developed by magnetic fields which originate from single or three--phase currents flowing perpendicularly to the structure. Magnetic phenomena and temperature increases of steel structures in alternating magnetic fields caused by high-voltage power lines differ widely from those in electric motors and transformers, because the magnetic flux permeating the steel is forced to the surface. It may be admitted that with strong magnetic fields produced by the connection of heavy generators with transformers the penetration fluctuating between 1 - 2 mm is nearly constant. Ferromagnetic materials cause distortion of magnetic fields. The degree of distortions depends on the mutual position of the structure's axis to the axis of the current transmission. The heating depends on the strength of the magnetic field on the surface. The following characteristics should be considered: a) Distortion of the magnetic field is negligible in long straight steel structures set

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Heating Effect of Alternating Magnetic Fields on Steel Structures

parallel to the power line; b) Distortion of the magnetic field is significant in steel structures perpendicular to the power line, especially if the distance between both is small in which case the heating is considerable; c) Power lines within straight steel structures cause equal field intensity on their surface, in case of round structures the field intensity is also equal, which grows if the distance of the power line is 20 - 50 cm, causing an intensive heating; d) On steel sheets parallel to the power line the magnetic field intensity and the heating are analogous to steel structures perpendicular to the power line. Thin 4 mm sheets are heated less than thick sheets. Heating of structures running parallel to the power line has been tested in 1953 - 1960 by Professor G.S. Borchaninov, Department of Power Plants of the Institute of Power Engineering in Moscow. In steel structures with single and three-phase magnetic fields the incoming and returning power lines had a quadrangular diagram, set up by four 100 x 10 mm aluminum bars with ventilation holes in the corners. The distance between incoming and returning power lines was 1.6 m. This distance had been chosen to reduce the interaction of magnetic fields with the possibility of watching the heating process in the areas of one power line. The intensity of the magnetic field was measured by a probe consisting

P/021/60/000/010/002/006
A105/A026

Heating Effect of Alternating Magnetic Fields on Steel Structures

of a flat spool on a 3-mm-wide and 0.82-mm-thick plastic plate. The power induced in the spool has been measured by an a-c compensating bridge, the temperature increase by a compensating method of thermoelements. Based on the results further examinations of temperature increase in steel structures were performed by Professor G.S. Borchaninov in the Institute of Power Engineering in Moscow. Temperature increase in steel structures in alternating magnetic fields of single and three-phase as well as of screened current transmitting were computed. The simplest protection of steel structures from excessive heating in alternating magnetic fields is a greater distance between the power line and the structures. If this is not possible, parts excessively heated should be covered by non-magnetic material. According to the recommendation by Professor G.S. Borchaninov the covers should be made of the same material as the power line current transmission, with 0.10 - 0.25 of the transmission crossection. There are 3 figures and 3 references: 2 Soviet and 1 Polish.

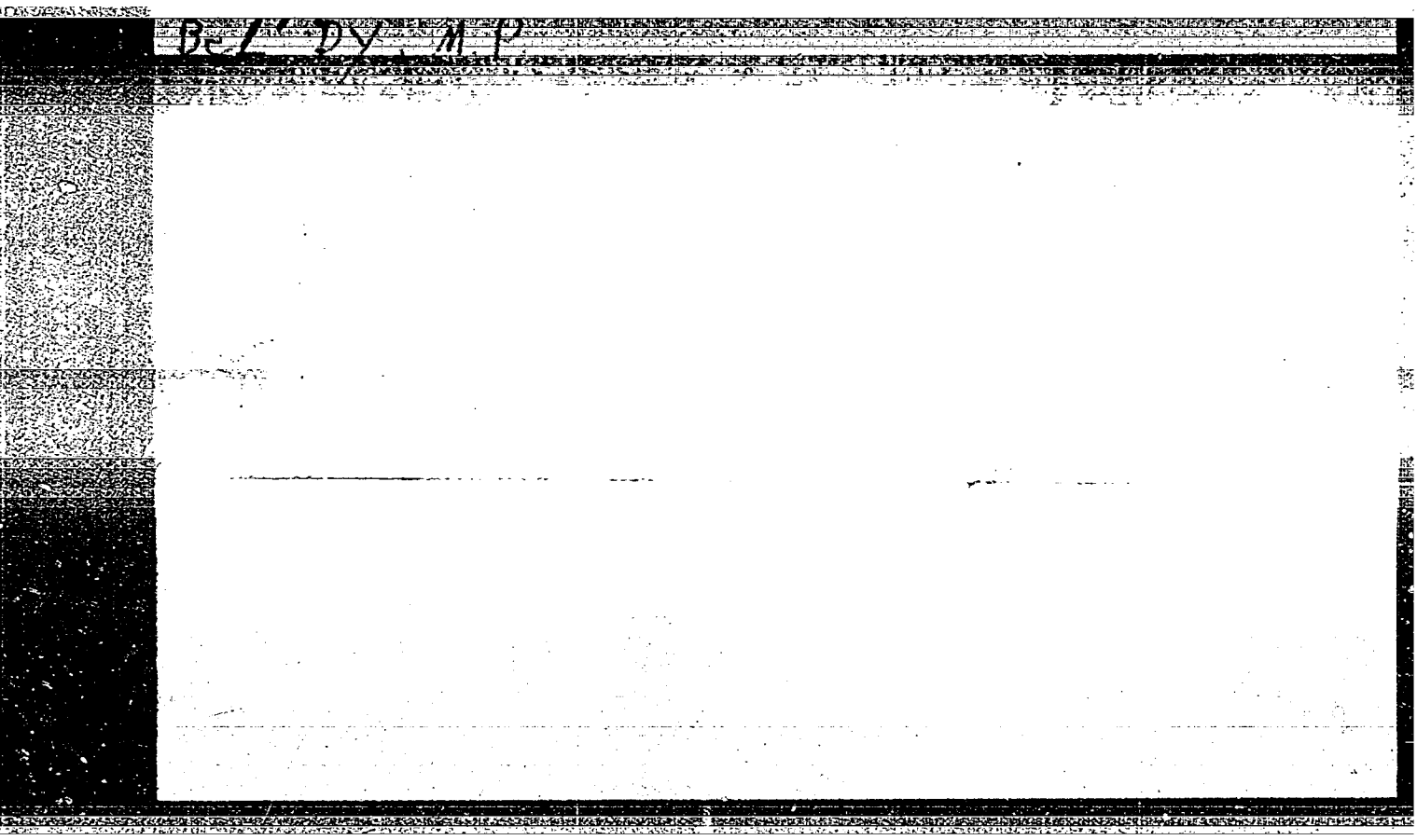
Card 3/3

BELDOWSKI, Tadeusz, mgr. ins.; ZAREBSKI, Witold, mgr. ins.

Screen bus bars. Energetyka Pol 15 no.8:Biuletyn:29-32 Ag '61.

1. Zaklad Elektryczny.

(Steel bars) (Screens)



33974
S/089/62/012/003/012/013
B102/B108

24.6400

AUTHOR: Bel'dy, M. P.

TITLE: Absorption and self-absorption effects of β-rays

PERIODICAL: Atomnaya energiya, v. 12, no. 3, 1962, 248 - 251

TEXT: The dependence of the β-ray absorption coefficient μ on the Al absorber thickness x was determined considering self-absorption. The curves $f(x) = \frac{1}{x}\ln\frac{J}{J_0}$ for β-rays from C^{14}, S^{35}, Ca^{45}, RaE, P^{32}, Cl^{38}, and other elements were calculated from experimental data. The f(x) curves can be given by $-\frac{1}{J}\frac{dJ}{dx} = \mu(x) = a + 2bx + 3cx^2$, where a, b, c are determined from experiments. The departures of the calculated from the measured f(x) curves amount to several percent and increase with decreasing J/J_0. The self-absorption factor s(x) is determined experimentally (Fig. 3, curve 1). When back-scattering is taken into account, $s(x) = 1/(k_1 + k_2x)$, where k_1 and k_2 are constants for the specific experimental conditions. The

Card 1/β 2

Absorption and self-absorption...

geometry factor ω was between 0.2 and 0.5. The departure of 1/s(x) from a straight line is due to back scattering and depends on the difference in the atomic numbers of backing and preparation materials. For relative measurements with different β-emitters $J = AxN/(B+x)$, where A and B are experimental constants. x is the preparation thickness (g/cm^2 or mg/cm^2), N - concentration of radioelement in % by weight, J - count rate without background. If $x \gg R$ (R is the β-particle range) $J = kN/\varrho$, ϱ is the preparation density, and k is a constant. There are 4 figures and 17 references: 5 Soviet and 12 non-Soviet. The four most recent references to English-language publications read as follows: E. Odeblad. Acta radiol. 48, 289 (1957); J. Harley, N. Hallden. Nucleonics, 13, 32 (1955); E. Agren. Acta radiol. 48, 385 (1957); M. Greenfield et al. Nucleonics, 15, 57 (1957).

SUBMITTED: April 3, 1961

Fig. 3. s(x) and 1/s(x) for S^{35} β-radiation in benzidine sulfate

Card 2/2

ZDANSKIY, A.B.; SOLOV'YEVA, Ye.F.; EZROKHI, L.L.; LYAKHOVSKAYA, Ye.I. Prinimali uchastiye: SHITIKOVA, V.S.; BEL'DY, M.P.; ROMANOVA, V.A.; PEL'SH, A.D., red.; KOTS, V.A., red.; LEVIN, S.S., tekhn. red.; ERLIKH, Ye.Ya., tekhn. red.

[Handbook of experimental data on the solubility of salt systems] Spravochnik eksperimental'nykh dannykh po rastvorimosti solevykh sistem. Leningrad, Goskhimizdat. Vol.4.[Two-component systems; elements of the IInd group and their compounds] Dvukhkomponentnye sistemy; elementy II gruppy i ikh soedineniia. Sost. A.B.Zdanskii i dr. Pod red. A.D.Pel'sha, 1963. 2231-2878 p. (MIRA 17:2)

1. Leningrad. Vsesoyuznyy nauchno-issledovatel'skiy institut galurgii. 2. Fiziko-khimicheskaya laboratoriya Vsesoyuznogo nauchno-issledovatel'skogo instituta galurgii (for Shitikova, Bel'dy, Romanova).

ACCESSION NR: AT4013984 S/3070/63/000/000/0157/0158

AUTHOR: Bel'dy*, M.P.

TITLE: Sample curette for work with cylindrical Beta and Gamma ray counters

SOURCE: Novy*ye mashiny* i pribory* dlya ispy* taniya metallov. Sbornik statey. Moscow, Metallurgizdat, 1963, 157-158

TOPIC TAGS: curette, cylindrical counter, Beta ray, Gamma ray, perchlorovinyl resin, radiation counter, glass

ABSTRACT: For work with cylindrical beta- and gamma-ray counters, glass curettes are frequently used with an inner wall thickness of 40-60 mg/cm^2. Such curettes absorb a considerable part of the radiation from even the hardest beta emitters. Thinner-walled glass curettes are very fragile, and therefore inconvenient in handling. Another disadvantage of glass curettes is that they have a noticeable background radiation and, besides, absorb various radioisotopes from the solutions, causing gross errors if the work is not carefully conducted. To avoid these difficulties, the author has proposed making the external body of the curette of organic glass and the inner testtube of perchlorovinyl resin with a 15-20 mg/cm^2 wall, or even 5-10 mg/cm^2 wall for use with small counter tubes.

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ACCESSION NR: AT4013984

The external body of such a curette is turned from a solid bar or formed from a sheet of organic glass. The bottom is then glued to the body, forming a ring of the same organic glass. The perchlorovinyl resin testtube is then inserted into the hole of the body bottom, protruding 1 cm through the hole centered and glued to the body with dichloroethane. After drying, the protruding part of the testtube is cut off. The procedure for making the plastic testtube by dipping a glass testtube into a solution of perchlorovinyl powder in dichloroethane drying the formed layer, and stripping the bag off the glass testtube is described in detail. The curette obtained is suitable for work with the STS-6 and AS-2 counters. The counter is mounted vertically for work with such a curette, the cathode grounded, and the positive charge applied from below (see Fig. 1 of the Enclosure). It has been recommended to select the gap l between the walls of the beaker according to the following expressions:

$$l_1 = 0.4\frac{R}{\rho} \quad \text{and} \quad l_2 = \frac{R}{\rho}$$

where ρ is the density of the sample and R the practical path of beta particles; subscrip 1 refers to curettes intended for work under conditions $0.2 < \rho l < R$, and subscript 2 refers to curettes warranting a "saturation layer". Orig. art. has: 2 figures.

Card 2/4

ACCESSION NR: AT4013984

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut galurgii (All-Union Scientific Research Institute of Halurgy)

SUBMITTED: 00	DATE ACQ: 20Feb64	ENCL: 01
SUB CODE: NP,MT	NO REF SOV: 001	OTHER: 000

Card 3/4

ACCESSION NR: AT4013984

ENCLOSURE: 01

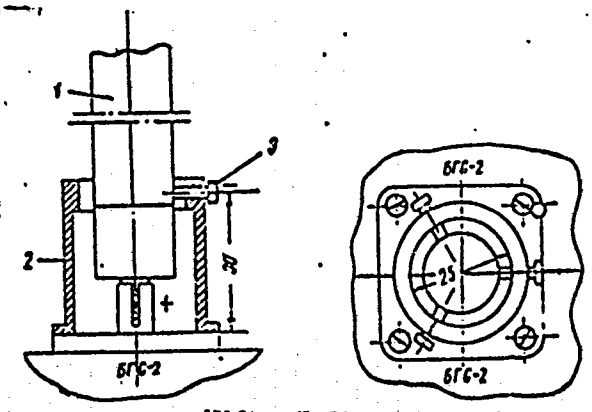

Fig. 1 - Variant fastening of the STS-6 Counter in a vertical position.
1 - counter STS-6
2 - conducting sleeve instead of screening ring of block BGS - 2
3 - contact - and set-screw (3 ea.)

Card 4/4

BEL'DYUGIN, Nikolay Mikhaylovich; GOVORUNOV, Pavel Pavlovich

[Best varieties of vegetable and melon crops for the Kabardian A.S.S.R. and their cultivation] Luchshie sorta ovoshchnykh i bakhchevykh kul'tur dlia Kabardinskoi ASSR i ikh agrotekhnika. Mal'chik, Kabardinskoe knizhnoe izd-vo, 1957. 89 p. (MIRA 10:9)
(Kabardia--Vegetable gardening)

S/106/62/000/005/002/007
A055/A101

9.2550

AUTHORS: Levitan, G.I.; Bel'dyugin, V.N.; Vostryakov, O.I.

TITLE: Control of the passband in narrow-band filters

PERIODICAL: Elektrosvyaz', no. 5, 1962, 12 - 23

TEXT: The object of this article is to examine the possibilities of controlling the passband of polynomial filters and of filters with attenuation peaks, or, rather, to examine them more thoroughly than this has been done until now. It is assumed that the control of the band must not change the shape of the selectivity characteristic. After an analysis of the conditions to be satisfied in polynomial filters of various types (k, m, VI and VI' types), the authors deal with the electrical control of the passband, such as it was first worked out in the Odessa Communication Institute in 1958 - 1959 and permitting to achieve an automatic or a remote control (and also to reduce the size and to simplify the construction of radio-apparatuses). To realize this control, it is possible to use ferrovariometers, controlled capacitors and also some electronic systems transforming the wave-impedance of the circuits. Point-contact diodes

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S/106/62/000/005/002/007
A055/A101

Control of the passband in narrow-band filters

or nonlinear resistances can be used for controlling the attenuation of the circuits. The authors examine first the control of the coupling between circuits, this control being effected by varying the resistance of the coupling; three systems permitting this control are described. The authors next examine the transformation of the wave-impedance of resonance circuits. In the last chapter of the article, they examine the control of the passband of filters with attenuation peaks. Most of the circuits described in the article are new, according to the authors. The article is purely analytical. The Soviet personalities mentioned in the article are: Yu.F. Korobov, P.K. Akul'shin, I.A. Koshcheyev, K.E. Kul'batskiy, N.I. Chistyakov, V.M. Sidorov and V.S. Mel'nikov. There are 24 figures and 9 references: 6 Soviet-bloc and 3 non-Soviet-bloc.

SUBMITTED: October 3, 1961

Card 2/2

S/169/62/000/010/028/071
D228/D307

AUTHORS: Bălan, Ştefan, Belc, Aurel and Ifrim, Mihail

TITLE: Tests on the seismic platform of some models of buildings

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1962, 30, abstract 10A194 (Studii şi cercetări astron. şi seismol., 6, no. 2, 1961, 315-324 (Rum.; summaries in Rus. and Fr.))

TEXT: The results of tests, carried out on a seismic platform over several models of stone buildings, are given together with information about the behavior of the stone buildings under the influence of earthquakes. Photographs show the set-up and the behavior of the models while being influenced by different forces.
[Abstracter's note: Complete translation]

Card 1/1

BELE, K.V. [Bele, C.V.]

Electrodynamic modeling of a three-phase asynchronous machine. Rev electrotechn energet 5 no.1:89-99 '60. (EEAI 10:4)
(Electric motors, Induction) (Electrodynamics)

[redacted], Adonisz

Hybridization possibilities between Triticum timopheevi Zhuk. and other wheat varieties and genetic analysis of the hybrids. [redacted]. Biol kozl 11 no.2:145-153 '64.

1. Agricultural Research Institute, Hungarian Academy of Sciences, Martonvasar. Director: Dr. Sandor Rajki.

WIERSZYLLOWSKI, Jerzy, doc. dr; BABILAS, Walenty; BELEC, Anna

Certain changes occurring in seeds of Prunus serasifera var. divaricata Bailey during the stratification process under 6°C steady temperature. Prace nauk roln i lesn 14 no.3:229-246 '63 [publ. '64].

1. Department of Pomology, College of Agriculture, Poznan. Head: Doc. Dr J. Wierszyllowski.

L 10479-66 EWP(v)/T/EWP(k)/EWP(h)/EWP(l) IJP(c)

ACC NR: AP6003542 SOURCE CODE: RU/0011/65/009/001/0004/0011

AUTHOR: Belea, C.--Belya, K. (Engineer; Doctor of technical sciences)

ORG: none

TITLE: Method of finite differences in the theory of continuous automatic systems

SOURCE: Automatica si electronica, v. 9, no. 1, 1965, 4-11

TOPIC TAGS: automatic control system, automatic control theory, automatic control design

ABSTRACT: A discussion of the algorithm with finite differences and its application in the study, calculation and design of automatic systems. Linear, non-linear and self-tuning systems are considered. Orig. art. has: 3 tables, 27 formulas. [JPRS]

SUB CODE: 13 / SUBM DATE: none / ORIG REF: 003 / SOV REF: 003

HW

Card 1/1 UDC: 621-501.1: 517.494

AUTHORS: Zegenesku, F., Engineer, Belfa, ~~K.~~, C.C. Engineer SOV/29-58-9-11/30

TITLE: From the Work of an Institute (Iz rabot odnogo instituta)

PERIODICAL: Tekhnika molodezhi, 1958, Nr 9, pp 18 - 19 (USSR)

ABSTRACT: 1)An Instrument for Measuring Mechanical Stress: An instrument was developed in the RPR (Rumanian People's Republic) which permits to measure by optical methods the distribution, the direction and the magnitude of stress in models subjected to external stresses. This instrument was designed by the Engineers V.Goran and E.Nikolau.
2)A "CAU-1" Simulator:The "CAU-1" is the first type of an alectronic simulator which was designed and built in the RPR. It permits to solve two problems simultaneously. It was built by a collective of scientists, consisting of S.Shekhter, Candidate of Technical Sciences, F. Muntyanu, Engineer, F. Konstantinesku, Engineer, T.Torsan, Engineer, and I.Endesh, Engineer.
3)Aerodynamical Supersonic Tunnel: Two years ago the first

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aerodynamic tunnel was constructed at the Institute of Applied Mechanics, AS RPh. A second, perfected tunnel was put into operation in 1958. This tunnel was designed by a collective. Among others, P. Ibanid, Candidate of Technical Sciences, and the Engineers E.Tsurkam and Ye.Moisey assisted in the work. There are 4 figures.

RUM/2-60-3-10/36

1(4)

AUTHORS: Zăgănescu, Florin, Engineer, Belea, C.C., Engineer, Candidate of Technical Sciences

TITLE: Aircraft Testing During Flight

PERIODICAL: Stiinţă şi Tehnică, Seria a II-a, 1960, Nr 3, pp 14-15

ABSTRACT: The author gives a brief description of the principles of aircraft testing in flight. Reference is made to Soviet test pilots, the majority of whom receive a prior training in technical institutes of higher learning. Further reference is made to the Soviet scientists I.I. Shuneyko, specialist in aircraft engines and to N.V. Adamovich, specialist in the stability and maneuverability of aircraft. The Soviet "T-114" and "IL-18" aircraft are also mentioned. There is 1 table and 1 photo.

Card 1/1

S/024/60/000/006/002/015
E140/E463

15.9500 (1031, 1121, 1152)

AUTHOR: Belya, ~~K.K.~~ (Bucharest)

TITLE: On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, No.6, pp.96-106

TEXT: The article considers the structures and parameters of automatic control systems invariant with respect to external disturbances and loading. The problem is put as a study of dynamic systems whose motions are described by differential equations with variable coefficients. The solution is to be found in such form that the variation of certain process parameters have negligible influence on the overall transient process of the system. In an adaptive system, the optimal control process with variation of object parameters is provided by an appropriate change in certain parameters of the regulator. Then there will be certain values of the regulator parameters a_{ij}^{o} corresponding to the optimal control process in a given sense. Considering a given regulator parameter a_{ij}, its deviation Δa_{ij} from the optimal value a_{ij}^{o}

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On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

will cause deterioration in the optimal process. In order for the system to be invariant with respect to Δa_{1j} suitable structures must be found. As shown in Fig.2, variations in the parameters in question may be considered as an equivalent external perturbation $\varphi_{\Delta}(t)$, where the actual values of the parameters shown in a are replaced by their optimal values as in b. The variations may then be measured by the circuit shown in Fig.3a, where the box a_{13}/a_{11} represents the actual regulator parameters, the box a^{o}_{13}/a^{o}_{11} represents a model of the regulator with these parameters at their optimal values; the actual external perturbation therefore enters the box a_{13}/a_{11} as shown in Fig.3b. A general solution of the problem is first found, taking into account the Hurwitz stability conditions. .. The deviation $\Delta x(t)$ of the regulated quantity from the optimal process is required to be identically equal to zero. Satisfaction of the conditions of invariance could be obtained by introducing changes in the regulator parameters as in adaptive systems. It would be more interesting

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On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

to achieve a certain degree of invariance without variation of the regulator parameters during operation of the system. The author shows that the invariance condition is equivalent to the introduction of a positive feedback into the regulator. Then the case of full invariance is an ideal case corresponding to infinite gain and, therefore, an unstable system. Thus, in practice, we require systems with only partial invariance and providing high quality processes without changes in the system structure. Several structures are examined. Two solutions to the invariance problem are indicated: a choice of the basic regulator parameters in accordance with the invariance conditions; introducing into the control system control with respect to variation of the controlled process transient from optimum in addition to control with respect to deviation of coordinate. In the first method it is necessary to operate on the basic parameters of the regulator while in the second (combined) method, invariance is obtained without variation of the basic regulator parameters.
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S/024/60/000/006/002/015
E140/E463

On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

Further, the first method in fact eliminates the process operators from the system dynamics while the second substitutes for them the operators of a standard (model) and the invariant system preserves the dynamic properties of the optimal system. Finally, the stability conditions of the first method are more difficult to realize than those of the combined system. An experimental example of the results which may be obtained is given in the Appendix. The system of Fig.7 was substituted by the system of Fig.9. Various responses of the original system (Fig.7) for variations of the object parameters are shown in Fig.8. Due to the instability already present (a, b) the amplifier gain could not be increased. The degree of invariance obtained in the modified system is shown in Fig.10 (gain K = 1 as in original system) and Fig.11 (K = 5). There are 12 figures and 5 Soviet references.

SUBMITTED: July 19, 1960

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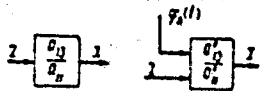
E140/E463

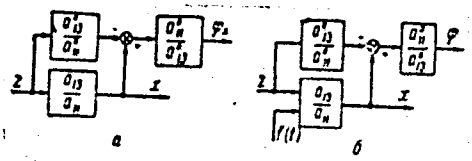
On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

Fig. 2. (2.1)



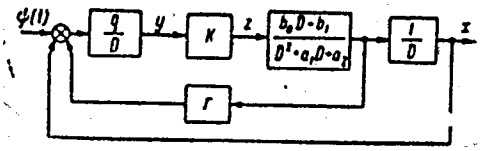
Фиг. 2

3. (2.2)



Фиг. 3

Fig 87



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On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters

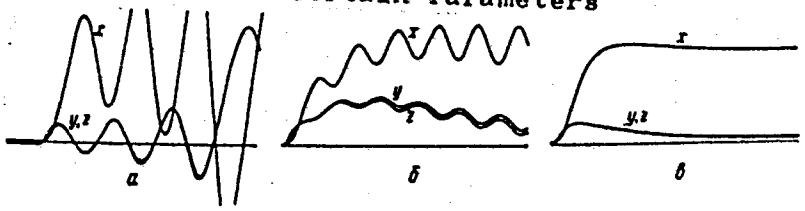

Fig. 8

Фиг. 8

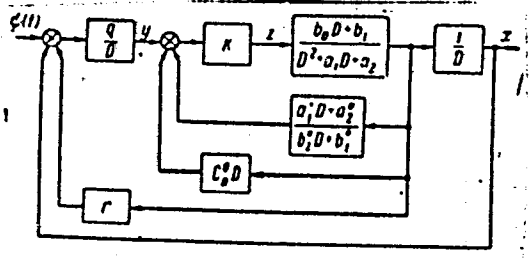

Fig. 9

Фиг. 9

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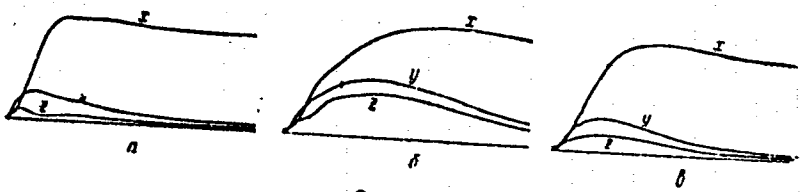
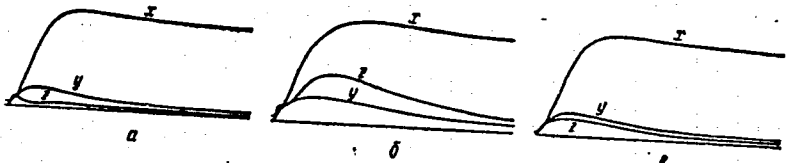
E140/E463

On the Invariance of the Controlled Quantity in an Automatic System With Respect to Certain Parameters



Фиг. 10

Fig. 10



Фиг. 11

Fig. 11

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S/103/60/021/008/004/014
B012/B063

AUTHOR: Belya, ~~K. K.~~ E. C. C. (Moscow)

TITLE: The Stability of Periodic Motions of Piecewise Linear Automatic Control Systems

PERIODICAL: Avtomatika i telemekhanika, 1960, Vol. 21, No. 8, pp. 1134-1140

TEXT: The author of the present paper proceeds from a set of equations (1) that describes the dynamic system under consideration, and obtains the operator equation (4) as periodic solutions: $L(D)z = -K(D)f(z) + F(t)$. L(D) and K(D) are linear differential operators. The author studies the stability of the periodic motions of such a piecewise linear system. As compared to the papers of Refs. 2-4, the author gives another method for the setup of a linear approximation and a direct method of solving the problem of the stability of a periodic motion. z is assumed to be

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a known periodic solution of equation (4). This solution may be ascribed either to an external effect, F(t), or to the dynamic properties of the nonlinear system itself at F(t) = const. F(t) is a time function with the period T. Formula (10) is derived, and it is shown that this formula is really the linear approximation according to Lyapunov, which makes it possible to determine the stability of the periodic motion $\tilde{z}(t)$. Formulas (12) and (14) are derived next. When the two formulas are taken together, they are equivalent to formula (10) and form another kind of linear approximation for the variation x(t). x(t) is a sufficiently small deviation of the disturbed motion z(t) of the system under consideration from the known undisturbed motion $\tilde{z}(t)$, i.e., $x(t) = z(t) - \tilde{z}(t)$. The two formulas (12) and (14) are integrated within the period of motion, and formula (16) is obtained. The latter contains a matrix, U, that is determined from formula (24). It is noted that the zero solution of formula (10) is asymptotically stable, so that in this case the periodic motion $\tilde{z}(t)$ is also asymptotically stable. Mention is made of the theorem by Andronov and Vitt. There are 6 Soviet references.

The Stability of Periodic Motions of Piecewise Linear Automatic Control Systems

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B012/B063

SUBMITTED: January 28, 1960

Vc

Card 3/3

31326
S/569/61/001/000/011/019
D274/D305

16.8000 (1103, 1329, 1031) C.C.

AUTHOR: Belea, ~~K. K.~~ (Rumania)

TITLE: Invariance of control systems with respect to parameter measurements

SOURCE: International Federation of Automatic Control. 1st Congress, Moscow, 1960. Teoriya nepreryvnykh sistem. Spetsial'nyye matematicheskiye problemy. Moscow, Izd-vo AN SSSR, 1961. Trudy, v. 1, 282-289

TEXT: The invariance of plant parameters with respect to system parameters which may vary during the operation is considered. The system

$$\begin{aligned} a_{11}x - \quad - a_{13}z &= f(t) \quad ; \\ a^0_{21}x + a^0_{22}y + a^0_{23}z &= \psi(t) \quad ; \\ a^0_{31}x + a^0_{32}y + a^0_{33}z &= 0 \end{aligned} \qquad (1)$$

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Invariance of control systems...

is considered, where x is the controlled variable; y, z—the generalized coordinates of the controller; $a_{11}(D)$, $a_{13}(D)$—differential operators of the plant whose coefficients can vary continuously; $a_2(D),\ldots, a_{33}(D)$—differential operators of the controller with constant coefficients. The problem consists in achieving invariance of dynamic processes with respect to a_{11}, a_{13} in a certain domain Ω of variation of the coefficients.

The equation of the object (plant) is written in the form

$$x = \frac{a_{13}}{a_{11}}(z + f) = \frac{a^0_{13}}{a^0_{11}} z + \left(\frac{a_{13}}{a_{11}} - \frac{a^0_{13}}{a^0_{11}}\right) z + \frac{a_{13}}{a_{11}} f = \frac{a^0_{13}}{a^0_{11}}(z + \varphi) \qquad (2)$$

where

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Invariance of control systems...

$$\varphi = \frac{a_{11}^0 \Delta a_{13} - a_{13}^0 \Delta a_{11}}{a_{13}^0 \left(a_{11}^0 + \Delta a_{11}\right)} z + \frac{a_{11}^0 \left(a_{13}^0 + \Delta a_{13}\right)}{a_{13}^0 \left(a_{11}^0 + \Delta a_{11}\right)} f \ , \qquad (3)$$

and

$$\Delta a_{11} = a_{11} - a_{11}^0 \ ; \quad \Delta a_{13} = a_{13} - a_{13}^0 \ .$$

Operator Eq. (2) can be considered as the equation with constant parameters a_{11}^0, a_{13}^0 of the object which is acted on by the conventional "disturbance" φ. According to Eq. (3), the "disturbance" depends on the deviations Δa_{11} and Δa_{13} from the optimum values, on the operating conditions z, and on the actual disturbance f. It can be readily seen that, if x can be made invariant of φ, it will be, thereby, an invariant of

Invariance of control systems...

Δa_{11}, Δa_{13}, as well as of f. The difficulty consists in the physical unfeasibility of the function φ and in the impossibility to determine it mathematically. Yet, an artificial device can be designed which realizes this function. The function φ can be regarded, on the one hand, as a formal "disturbance" of the optimum conditions, and, on the other hand, as a deviation of the actual process from the optimal one, whereby this deviation can be measured. The invariance principle is applicable to φ just as to any other regular function. The invariance conditions are obtained from the system

$$\begin{aligned} a_{11}^0 x - a_{13}^0 z &= a_{13}^0 \varphi(t) \; ; \\ a_{21}^0 x + a_{22}^0 y + a_{23}^0 z &= \psi(t) + b_2 \varphi(t) \; ; \\ a_{31}^0 x - a_{32}^0 y + a_{33}^0 z &= b_3 \varphi(t) \; , \end{aligned} \qquad (4)$$

as

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Invariance of control systems...

$$b_2 = -a_{23}^0 , \qquad b_3 = -a_{33}^0 . \tag{5}$$

Hence, it follows that invariance conditions (5) signify an infinite gain factor K of the controller and that therefore it is impossible to achieve in practice complete invariance of x with respect to Δa_{11} and Δa_{13}. Invariance to an accuracy ε is possible. Further, the stability of the structurally invariant system is considered in connection with the degeneration of the characteristic equation as a result of increasing K. It is found that the invariant system retains its stability with any a_{11}, $a_{13} \in \Omega$ and arbitrarily large K. As an example, the results obtained by the author on the integrator for the system of Fig. 6 are given. There are 12 figures.

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Invariance of control systems...

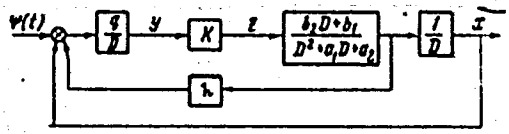

Fig. 6.

Fig. 6

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16.4000 (1103, 1031, 1132)

AUTHOR: Belya, K. K. (Bucharest)

TITLE: Accurate determination of periodic regimes in a relay system of automatic control containing several relay elements

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 12, 1961, 1608-1619

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TEXT: The author gives the exact solution of the problem of oscillations in an automatic relay control system of arbitrary structure and with any finite number of switching elements with arbitrary characteristics, described by the set of differential equations fundamental to the system

$$\dot{x}_k = \sum_{\alpha=1}^{n} a_{k\alpha} x_\alpha + \sum_{\beta=1}^{m} b_{k\beta} f_\beta(\sigma_\beta) \qquad (k = 1,2,\ldots,n) \qquad (1a)$$

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Accurate determination of ...

$$\sigma_\beta = \sum_{\gamma=1}^{n} c_{\beta\gamma} x_\gamma \qquad (\beta = 1,2,\ldots,m) \tag{1b}$$

Here $a_{k\alpha}$, $b_{k\alpha}$, $c_{\beta\gamma}$ - are constants, $f_\beta(\sigma_\beta)$-arbitrary non-linear functions, n - order of the system , m - number of non-linearities. The equations of the control system are reduced to

$$N(p)\, y_\beta = f_\beta(\sigma_\beta) \tag{5a}$$

$$\sigma_\beta = \sum_{\delta=1}^{m} M_{\beta\delta}(p)\, y_\delta \qquad (\beta = 1,2,\ldots,m) \tag{5b}$$

where N(p) is the characteristic polynomial of system (1) and $M_{\beta\delta}(p)$

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Accurate determination of ...

is the operator obtained from N(p) by replacing the s-th column of the determinant of N(p) consecutively by columns of $b_{k\beta}$ for all values of β, y_β - new variables, related to original variables x_k by

$$x_k = \sum_{\delta=1}^{m} M_k^{\delta}(p)\, y_\delta \qquad (6)$$

The periodic solutions of (5) are sought and derived in the form of full Fourier series for the case when the periodic movements can be represented by normal "switching" of non-linear elements, or that the sequence of "switching" of each non-linear characteristic is independently known. The Fourier series derived has its coefficients such that there is no need to restrict instants, at which the switching of different non-linear characteristics occurs. When the automatic control system has relay characteristics, the periodic solutions are expressed exclusively by the unknown discrete instants of switching $t_{\beta j_\beta}$, related to each other by a system of N_1,

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